CLAIMS

What is claimed is:

1. A CT imaging system, comprising:

an X-ray source comprising two or more discrete, emission points, wherein the emission points are configured to be individually activated and wherein each emission point, when activated, emits a respective stream of radiation through a respective portion of a field of view; and

a detector array comprising a plurality of detector elements, wherein each detector element may generate one or more signals in response to the respective streams of radiation.

2. The CT imaging system, as recited in claim 1, wherein the two or more discrete, emission points comprise X-ray tubes.

3. The CT imaging system, as recited in claim 1, wherein the X-ray source comprises one of a solid-state X-ray source and a thermionic X-ray source.

4. The CT imaging system, as recited in claim 1, wherein the two or more discrete, emission points comprise field emitters.

5. The CT imaging system, as recited in claim 1, wherein the detector array comprises a flat panel detector.

6. The CT imaging system, as recited in claim 1, wherein the detector array comprises an energy discrimination detector.

7. The CT imaging system, as recited in claim 1, wherein the X-ray source comprises duplicate emission points along the longitudinal axis.

8. The CT imaging system, as recited in claim 1, wherein the X-ray source comprises offset emission points along the longitudinal axis.

9. The CT imaging system, as recited in claim 1, wherein the two or more emission points are rotated about the field of view such that each emission point, when activated, emits the respective stream of radiation from a respective view angle.

10. The CT imaging system, as recited in claim 9, wherein the two or more emission points are rotated by mechanically rotating the emission points about the field of view.

11. The CT imaging system, as recited in claim 9, wherein the two or more emission points are effectively rotated by activation of stationary emission points disposed in a ring about the field of view.

12. The CT imaging system , as recited in claim 11, wherein the stationary emission points are configured to be sequentially activated.

13. The CT imaging system, as recited in claim 9, wherein a first subset of the two or more emission points are activated at a first set of view angles and wherein a second subset of the two or more emission points are activated at a subset of the first set of view angles.

14. The CT imaging system, as recited in claim 13, wherein the first set of view angles comprises every view angle and wherein the subset comprises every other view angle.

15. The CT imaging system, as recited in claim 9, wherein the flux of each respective stream of radiation is determined based on the respective view angle and a respective path length through a patient.

16. The CT imaging system, as recited in claim 1, further comprising:

a system controller configured to control the one or more X-ray sources and to acquire the one or more signals from the plurality of detector elements via a data acquisition system;

a computer system configured to receive the one or more signals and to process the one or more signals to generate one or more images; and

an operator workstation configured to display the one or more images.

17. A method for CT imaging, the method comprising the acts of:

rotating an X-ray source about a field of view, wherein the X-ray source comprises two or more, discrete emission points;

individually activating at least two of the emission points at view angles around the field of view, such that each emission point emits a respective stream of radiation through a respective portion of the field of view when activated;

acquiring a plurality of signals from a detector, wherein the plurality of signals are generated in response to the respective streams of radiation; and

processing the plurality of signals to generate one or more images.

18. The method, as recited in claim 17, wherein individually activating at least two of the emission points comprises activating a first set of emission points at a first set of view angles and activating a second set of emission points at a second set of view angles.

19. The method, as recited in claim 18, wherein the second set of view angles comprises a subset of the first set of view angles.

20. The method, as recited in claim 17, further comprising the act of:

determining the flux of each stream of radiation based on respective view angle and a respective path length through a patient.

21. The method, as recited in claim 17, wherein rotating the X-ray source comprises mechanically rotating the X-ray source about the field of view.

22. The method, as recited in claim 17, wherein effectively rotating the X-ray source comprises activating the two or more emission points in a sequence, wherein the two or more emission points are disposed in a stationary ring about the field of view.

23. A computer program, provided on one or more computer readable media, for imaging a field of view, comprising:

a routine for rotating an X-ray source about a field of view, wherein the X-ray source comprises two or more, discrete emission points; and

a routine for individually activating at least two of the emission points at view angles around the field of view, such that each emission point emits a respective stream of radiation through a respective portion of the field of view when activated.

24. The computer program, as recited in claim 23, further comprising:

a routine for acquiring a plurality of signals from a detector, wherein the plurality of signals are generated in response to the respective streams of radiation; and

a routine for processing the plurality of signals to generate one or more images.

25. The computer program, as recited in claim 23, wherein the routine for individually activating at least two of the emission points activates a first set of emission points at a first set of view angles and activates a second set of emission points at a second set of view angles.

26. The computer program, as recited in claim 25, wherein the second set of view angles comprises a subset of the first set of view angles.

27. The computer program, as recited in claim 23, comprising:

a routine for determining the flux of each stream of radiation based on respective view angle and a respective path length through a patient.

28. A CT imaging system, comprising:

means for rotating an X-ray source about a field of view, wherein the X-ray source comprises two or more, discrete emission points; and

means for individually activating at least two of the emission points at view angles around the field of view, such that each emission point emits a respective stream of radiation through a respective portion of the field of view when activated.